

Development of an Open-Source Integrated Testing Strategy for Skin Sensitization Potency

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References

Dethlefsen C, Højsgaard S. 2005. A common platform for graphical models in R: The gRbase package. *J Stat Softw* 14: 1-12.

Dimitrov SD, Low LK, Patlewicz GY, et al. 2005. Skin sensitization: modeling based on skin metabolism simulation and formation of protein conjugates. *Int J Toxicol* 24: 189–204.

Højsgaard S. 2012. Graphical independence networks with the gRain package for R. *J Stat Softw* 46: 1-26.

ICCVAM. 2009. Recommended Performance Standards: Murine Local Lymph Node Assay. NIH Publication No. 09-7357. Research Triangle Park, NC:National Institute of Environmental Health Sciences. Available at http://iccvam.niehs.nih.gov/methods/immunotox/llna_PerfStds.htm

Jaworska J, Harol A, Kern PS, Gerberick GF. 2011. Integrating non-animal test information into an adaptive testing strategy—skin sensitization proof of concept case. *ALTEX* 28: 211–225.

Jaworska J, Dancik Y, Kern P, Gerberick GF, Natsch A. 2013. Bayesian integrated testing strategy to assess skin sensitization potency: from theory to practice. *J Appl Toxicol* 33: 1353–1364.

Kasting GB, Miller MA, Nitsche JM. 2008. Absorption and evaporation of volatile compounds applied to skin. In: *Dermatologic, Cosmeceutic and Cosmetic Development* (Walters KA and Roberts MS, eds). New York:Informa Healthcare USA, 385–400.

Kim HJ. 2012. Discretization: data reprocessing, discretization for classification. R package version 1.0-1.

Linzer DA, Lewis J. 2011. poLCA: an R package for polytomous variable latent class analysis. *J Stat Softw* 42: 1-29.

OECD. 2010. Test No. 429. Skin Sensitisation: Local Lymph Node Assay [adopted 22 July 2010]. In: OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects. Paris:OECD Publishing. Available: <http://dx.doi.org/10.1787/9789264071100-en>

OECD. 2012. OECD Series on Testing and Assessment No. 168. The Adverse Outcome Pathway for Skin Sensitisation Initiated by Covalent Binding to Proteins, Part 1: Scientific Assessment. Paris:OECD Publishing. Available: <http://www.oecd.org/env/ehs/testing/adverse-outcome-pathways-molecular-screening-and-toxicogenomics.htm> [accessed 2 Dec 2013]

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R Development Core Team. 2008. R: A Language and Environment for Statistical Computing (ISBN 3-900051-07-0). Vienna, Austria:R Foundation for Statistical Computing. Available: www.R-project.org